ATOMIC CITY (PWS 6060003)
SOURCE WATER ASSESSMENT FINAL REPORT

January 1, 2004

State of Idaho
Department of Environmental Quality

Executive Summary

Under the Safe Drinking Water Act Amendments of 1996, all states are required by the U.S. Environmental Protection Agency (EPA) to assess every source of public drinking water for its relative sensitivity to contaminants regulated by the act. This assessment is based on a land use inventory of the designated assessment areas and sensitivity factors associated with the spring and the aquifer characteristics.

This report, *Source Water Assessment for Atomic City, Idaho*, describes the public water system (PWS), the boundaries of the zones of water contribution, and the associated potential contaminant sources located within these boundaries. This assessment should be used as a planning tool, taken into account with local knowledge and concerns, to develop and implement appropriate protection measures for this source. **The results should not be used as an absolute measure of risk and they should not be used to undermine public confidence in the water system.**

The Atomic City PWS (# 6060003) is a community drinking water system located in Bingham County. The water system consists of one well, tagged as E0007277, that is thought to have been drilled in 1950. The well is located within the city. Water from the well is pumped to a 7,000-gallon storage reservoir and then pumped into the distribution system. The water system currently has no chlorinating treatment. There are four pressure tanks, three 100-gallon tanks and one 200-gallon tank, to maintain pressure through the system between 45 and 65 pounds per square inch (psi). The water system currently serves 28 persons through 20 unmetered connections.

The potential contaminant sources within the delineation capture zones include an abandoned well; an open, but not actively used, underground storage tank (UST) (labeled as MapID 1); U.S. Route 26; an old landfill/borrow pit; and approximately 10 to 15 septic tanks within the city. If the open UST is not properly maintained it may add volatile organic chemical (VOC) contaminants and synthetic organic chemical (SOC) contaminants to the ground water. If an accidental spill or release occurred into the abandoned well or on the highway, inorganic chemical (IOC) contaminants, VOC contaminants, SOC contaminants and microbial contaminants could be added to the aquifer system. The residents in Atomic City use individual septic tanks that may add IOC contaminants and microbial contaminants to the ground water. All potential contaminant sources identified within the delineated area may increase the overall vulnerability of the drinking water source.

The final susceptibility scores for the Atomic City water system were derived from equally-weighted system construction scores, hydrologic sensitivity scores, and potential contaminant/land use scores. A low rating in one or two categories coupled with a higher rating in another category results in a final rating of low, moderate, or high susceptibility. With the potential contaminants associated with most urban and heavily agricultural areas, the best score a well can get is moderate. Potential contaminants are divided into four categories: IOCs (e.g., nitrates, arsenic), VOCs (e.g., petroleum products), SOCs (e.g., pesticides), and microbial contaminants (e.g., bacteria). As different wells may be subject to various contamination settings, separate scores are given for each type of contaminant.

For the assessment, a review of laboratory tests was conducted using the State Drinking Water Information System (SDWIS). Total coliform bacteria have been detected in the distribution system several times between July 1998 and March 2002 with two maximum contaminant level (MCL) violations that resulted in boil orders. Bacteria have not been detected in the distribution system since. It is unknown whether coliform bacteria have been detected at the wellhead. No SOCs or VOCs have

been detected in the well water. The IOCs barium, chromium, fluoride, mercury, and nitrate have been detected in the well water but at concentrations below the MCL for each chemical, as established by the EPA. Other chemicals identified were calcium, chloride, magnesium, manganese, potassium, sodium, sulfate and zinc in low concentrations. Traces of alpha and beta particles (i.e., radionuclides) have also been detected in the water system.

In terms of total susceptibility, the well rated high for IOCs, VOCs, SOCs, and microbial contaminants. The lack of subsurface information and the well driller's log to determine well construction materials and methods increases the well susceptibility scores. The hydrologic sensitivity rated high and the system construction rated high. The potential contaminant/land use scores were moderate for IOCs, VOCs and SOCs, and low for microbial contaminants.

This assessment should be used as a basis for determining appropriate new protection measures or re-evaluating existing protection efforts. No matter what ranking a source receives, protection is always important. Whether the source is currently located in a "pristine" area or an area with numerous industrial and/or agricultural land uses that require surveillance, the way to ensure good water quality in the future is to act now to protect valuable water supply resources. If the system should need to expand in the future, new drinking water source sites should be located in areas with as few potential sources of contamination as possible, and the site should be reserved and protected for this specific use.

An effective drinking water protection program is tailored to the particular local drinking water protection area. A community with a fully developed drinking water protection program will incorporate many strategies. For Atomic City, drinking water protection activities should first focus on correcting any improvements outlined in the 2003 sanitary survey (an inspection conducted every five years with the purpose of determining the physical condition of a water system's components and its capacity), including adding a flow meter on the system and developing a backflow prevention plan. The water system is planning to install a screened vent on the wellhead while replacing the well's pump in Spring 2004. If total coliform becomes a concern, the water system should consider developing a flushing and disinfecting plan. The city's distribution system has several dead end lines that could result in stagnant water and increase the chances of bacteria growth. Contact the Southeastern District Health Department Drinking Water Coordinator to inquire about disinfecting options suitable for the size of the water system. It is important to evaluate possible sources of contamination, such as the ones included in this assessment, and document those sources to identify contaminant threats early that could impact the drinking water well. Other sources to evaluate near the well are residential areas with septic tanks and drainage fields to assist with preventing nitrate and bacteria contamination from those sources. The water system may want to investigate other on-site concerns including surface water drainage from parking areas to assure that the wellhead is protected from surface water contaminants. The city is currently evaluating system upgrades to the storage capacity and distribution lines. They are also evaluating customer rate increases and the use of meters to accurately assess water use.

Due to the time involved with the movement of ground water, drinking water protection activities should be aimed at long-term management strategies even though these strategies may not yield results in the near term. The water system is encouraged to develop a drinking water protection plan to document and rank potential contaminant sources, outline best management practices, and provide education for city staff and residents about the drinking water. A strong public education program should be a primary focus of any drinking water protection plan. Public education topics could include household hazardous waste disposal methods and the importance of water conservation. There are multiple resources available to help communities implement protection programs, including the Drinking Water Academy of the EPA. Working with the Idaho Department of Transportation, the Bingham County Soil and Conservation District, Bureau of Land Management, adjacent businesses and land owners will better inform the water system of chemicals that may be used or stored near the drinking water well.

A community must incorporate a variety of strategies in order to develop a comprehensive drinking water protection plan, be they regulatory in nature (e.g., zoning, permitting) or non-regulatory in nature (e.g., good housekeeping, public education, specific best management practices). For assistance in developing protection strategies please contact the Idaho Department of Environmental Quality Pocatello Regional Office or the Idaho Rural Water Association.

SOURCE WATER ASSESSMENT FOR
ATOMIC CITY, IDAHO

Section 1. Introduction - Basis for Assessment

The following sections contain information necessary to understand how and why this assessment was conducted. **It is important to review this information to understand what the ranking of this assessment means.** Maps showing the delineated source water assessment area and the inventory of significant potential sources of contamination identified within that area are included. The list of significant potential contaminant source categories and their rankings used to develop the assessment also is included.

Level of Accuracy and Purpose of the Assessment

The Idaho Department of Environmental Quality (DEQ) is required by the U.S. Environmental Protection Agency (EPA) to assess over 2,900 public water system (PWS) sources in Idaho for their relative susceptibility to contaminants regulated by the Safe Drinking Water Act. This assessment is based on a land use inventory of the delineated assessment area, sensitivity factors associated with the drinking water source, and aquifer characteristics. The resources and time available to accomplish assessments are limited. Therefore, an in-depth, site-specific investigation to identify each significant potential source of contamination for every public water supply system is not possible. **This assessment should be used as a planning tool, taken into account with local knowledge and concerns, to develop and implement appropriate protection measures for this source. The results should not be used as an absolute measure of risk and they should not be used to undermine public confidence in the PWS.**

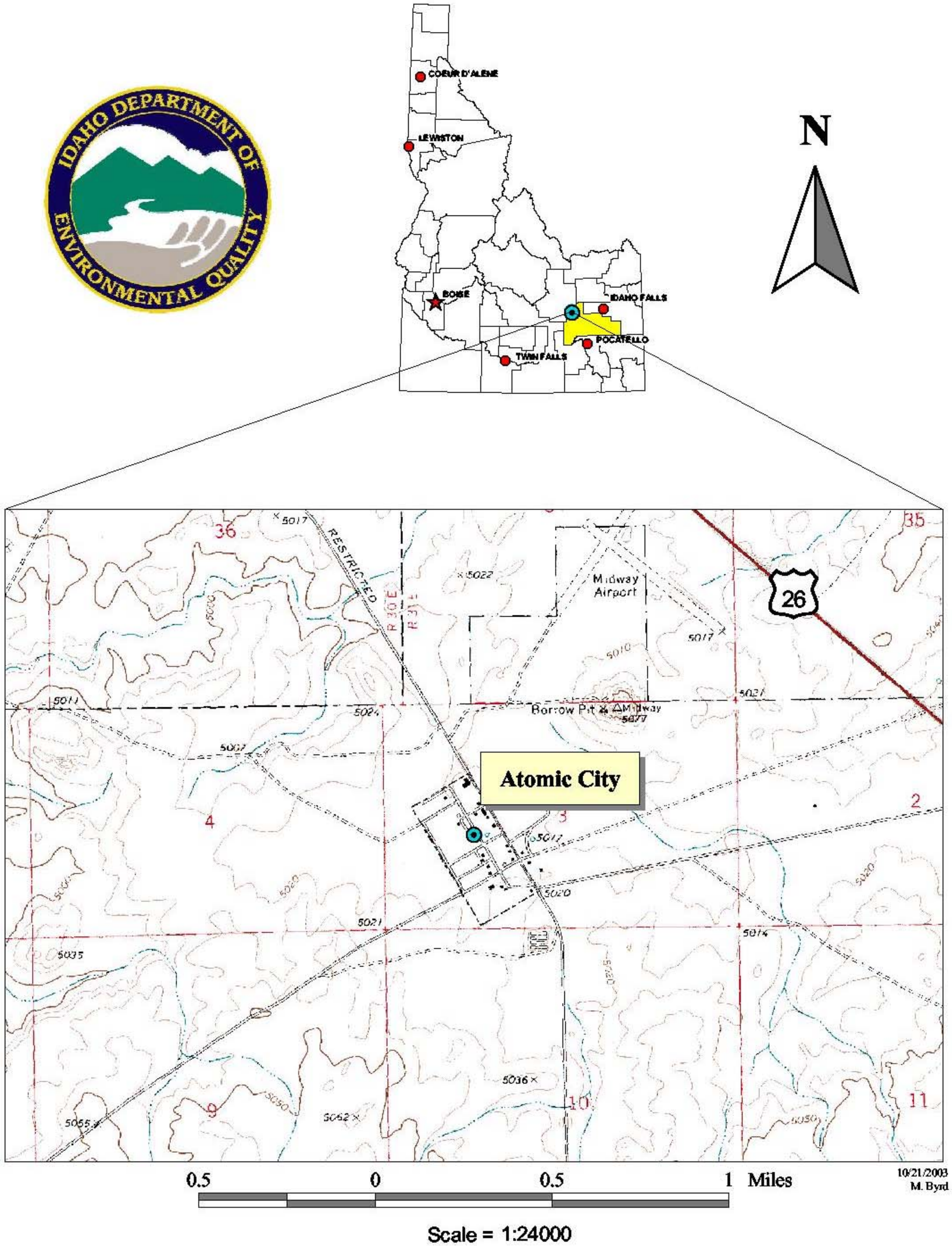
The ultimate goal of the assessment is to provide data to local communities to develop a protection strategy for their drinking water supply system. DEQ recognizes that pollution prevention activities generally require less time and money to implement than treatment of a public water supply system once it has been contaminated. DEQ encourages communities to balance resource protection with economic growth and development. The decision as to the amount and types of information necessary to develop a drinking water protection program should be determined by the local community and be based upon its own needs and limitations. Wellhead or drinking water protection is one facet of a comprehensive growth plan, and it can complement ongoing local planning efforts.

Section 2. Conducting the Assessment

General Description of the Source Water Quality

The Atomic City PWS (# 6060003) is a community drinking water system located in Bingham County (see Figure 1). The water system consists of one well, tagged as E0007277, that is thought to have been drilled in 1950. The well is located within the city. Water from the well is pumped to a 7,000-gallon storage reservoir and then pumped into the distribution system. The water system currently has no chlorinating treatment. There are four pressure tanks, three 100-gallon tanks and one 200-gallon tank, to maintain pressure through the system between 45 and 65 pounds per square inch (psi). The water system currently serves 28 persons through 20 unmetered connections.

Figure 1 - Geographic Location of Atomic City (PWS No. 6060003) in Bingham County.



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No SOCs or VOCs have been detected in the well water. The IOCs barium, chromium, fluoride, mercury, and nitrate have been detected in the well water but at concentrations below the MCL for each chemical, as established by the EPA. Other chemicals identified were calcium, chloride, magnesium, manganese, potassium, sodium, sulfate and zinc in low concentrations. Traces of alpha and beta particles (i.e., radionuclides) have also been detected in the water system.

Defining the Zones of Contribution – Delineation

The delineation process establishes the physical area around a drinking water source that will become the focal point of the assessment. The process includes mapping the boundaries of the zones of contribution into time-of-travel (TOT) zones (zones indicating the number of years necessary for a particle of water to reach a pumping well) for water in the aquifer. Washington Group International (WGI) provided the hydrologic assessment which DEQ utilized to define the PWS's 3-year (Zone 1B), 6-year (Zone 2), and 10-year (Zone 3) TOT zones of contribution. WGI used refined analytical methods approved by the Source Water Assessment Plan (DEQ, 1999) for water associated with the Snake Plain of the Eastern Snake River Plain hydrologic province. The computer model used site specific data from a variety of sources including operator records, well driller's logs and hydrogeologic reports. Due to the location of Atomic City, site specific model simulations were completed to more accurately represent the well's zones of contribution. A summary of the hydrogeologic information is provided below.

Hydrogeologic Conceptual Model

The ESRP is a northeast trending basin located in southeastern Idaho. The 10,000 square miles of the plain are primarily filled with highly fractured layered Quaternary basalt flows of the Snake River Group, which are intercalated with terrestrial and lacustrine sediments along the margins (Garabedian, 1992, p. 5). Individual basalt flows range from 10 to 50 feet thick, averaging 20 to 25 feet thick (Lindholm, 1996, p. 14). Basalt is thickest in the central part of the eastern plain and thins toward the margins. Whitehead (1992, p. 9) estimates the total thickness of the flows to be as great as 5,000 feet. A thin layer (0 to 100 feet) of windblown and fluvial sediments overlies the basalt.

The plain is bounded on the northeast by rocks of the Yellowstone Group (mainly rhyolite) and Idavada Volcanics to the southwest. These rocks may also underlie the plain (Garabedian, 1992, p. 5). Granite of the Idaho batholith borders the plain to the northwest along with sedimentary and metamorphic rocks (Cosgrove et. al., 1999, p. 10). The Snake River flows along part of the southern boundary and is the only drainage that leaves the plain.

A high degree of connectivity with the regional aquifer system is displayed over much of the Snake River as it passes through the plain. However, some reaches are believed to be perched, such as the Lewisville-to-Shelley reach. Rivers and streams entering the plain from the south are tributary to the Snake River. With the exception of the Big and Little Wood rivers, rivers entering the plain from the north vanish into the highly transmissive basalts of the Snake River Plain aquifer.

The layered basalts of the Snake River Group host one of the most productive aquifers in the United States. The aquifer is generally considered unconfined, yet may be confined locally because of interbedded clay and dense unfractured basalt (Whitehead, 1992, p. 26). Whitehead (1992, p. 22) reports that well yields of 2,000 to 3,000 gallons/minute are common for wells open to less than 100 feet of the aquifer. Transmissivities obtained from test data in the upper 100 to 200 feet of the aquifer range from less than 0.1 feet^2/second to 56 feet^2/second (1.0×10^4 to 4.8×10^6 feet^2/day; Garabedian, 1992, p. 11, and Lindholm, 1996, p. 18). Lindholm (1996, p. 18) estimates aquifer thickness to range from several hundred feet near the plain's margin to thousands of feet near the center. Models of the regional aquifer have used values ranging from 200 to 3,000 feet to represent aquifer thickness (Cosgrove et. al., 1999, p. 15).

Regional ground water flow is to the southwest paralleling the basin (Cosgrove et. al., 1999, p. 21; deSonneville, 1972, p. 78; Garabedian, 1992, p. 48 and; Lindholm, 1996, p. 23). Reported water table gradients range from 3 to 100 feet/mile and average 12 feet/mile (Lindholm, 1996, p. 22). Gradients steepen at the plain's margin and at discharge locations. Estimated effective porosities range from 0.04 to more than 0.25 (Ackerman, 1995, p.1 and Lindholm, 1996, p. 16).

The majority of aquifer recharge results from surface water irrigation activities (incidental recharge), which divert water from the Snake River and its tributaries (Ackerman, 1995, p. 4 and Garabedian, 1992, p. 11). Natural recharge occurs through stream losses, direct precipitation, and tributary basin underflow.

Aquifer discharge occurs primarily as seeps and springs on the northern wall of the Snake River canyon near Thousand Springs and near American Falls and Blackfoot (Garabedian, 1992, p. 17). To a lesser degree, discharge also occurs through pumping and underflow.

Modeling Simulations specific to Atomic City

The closest WGI models to this area were the models created in the Mud Lake area and in the American Falls area. As Atomic City is located nearly equidistant between these two areas, the boundary conditions of these areas were used to bound the Atomic City model. South of Mud Lake, a constant head potentiometric surface elevation of 4535 feet msl (above mean sea level) was set. On the north side of American Falls reservoir, a constant head potentiometric surface elevation of 4400 feet msl was set. These two constant head, line sinks constrained the water table for the area of interest. In the immediate area of Atomic City, Middle Butte and East Butte were separated from the flow regime by no-flow boundary conditions.

Local domestic and stock wells in the area were used as test points to check the accuracy of the modeled water table. As 28 people use the drinking water (Southeastern District Health Department, 2003), a conservative estimate of the water pumped was derived from the following equation, including a 50 percent increase for growth:

$$Q = 28 \text{ persons} * 300 \text{ gallons/day/person} * 1.5 = 12{,}600 \text{ gallons/day} = 1684 \text{ feet}^3\text{/day}$$

Multiple simulations were run using a range of aquifer parameters consistent with the area. Hydraulic conductivity ranged from 120 feet/day to 4000 feet/day. In the absence of a well log, the thickness of aquifer available to be pumped was given the range of 50 feet to 200 feet. Porosity was set at 15 percent. Recharge was kept near zero, as the other wells in the area showed water tables in the range of 550 feet below ground surface (bgs).

The final delineation is a composite of the various simulations conducted. In addition, as the direction of ground water flow in the area of the well is not as well defined as the regional ground water flow, a 15 degree buffer zone from the center line of the delineation was added. Finally, given the nature of fracture flow in the area of the well head, a 500-foot circular buffer was placed immediately adjacent to the wellhead.

In summary, the safety factor for the Snake Plain subprovince includes an input variation component to account for parameter uncertainty, a pumping rate multiplier to account for near-term growth and/or seasonal variations in discharge, an angular component to account for flow direction uncertainty, and a buffer to provide conservatism in the natural downgradient direction. Based on available data, this treatment of model uncertainty is considered reasonable but not overly conservative.

The delineated source water assessment area for the Atomic City well is conical in shape and approximately two miles in length (see Figure 2). The actual data used in determining the source water assessment delineation area is available from DEQ upon request.

Identifying Potential Sources of Contamination

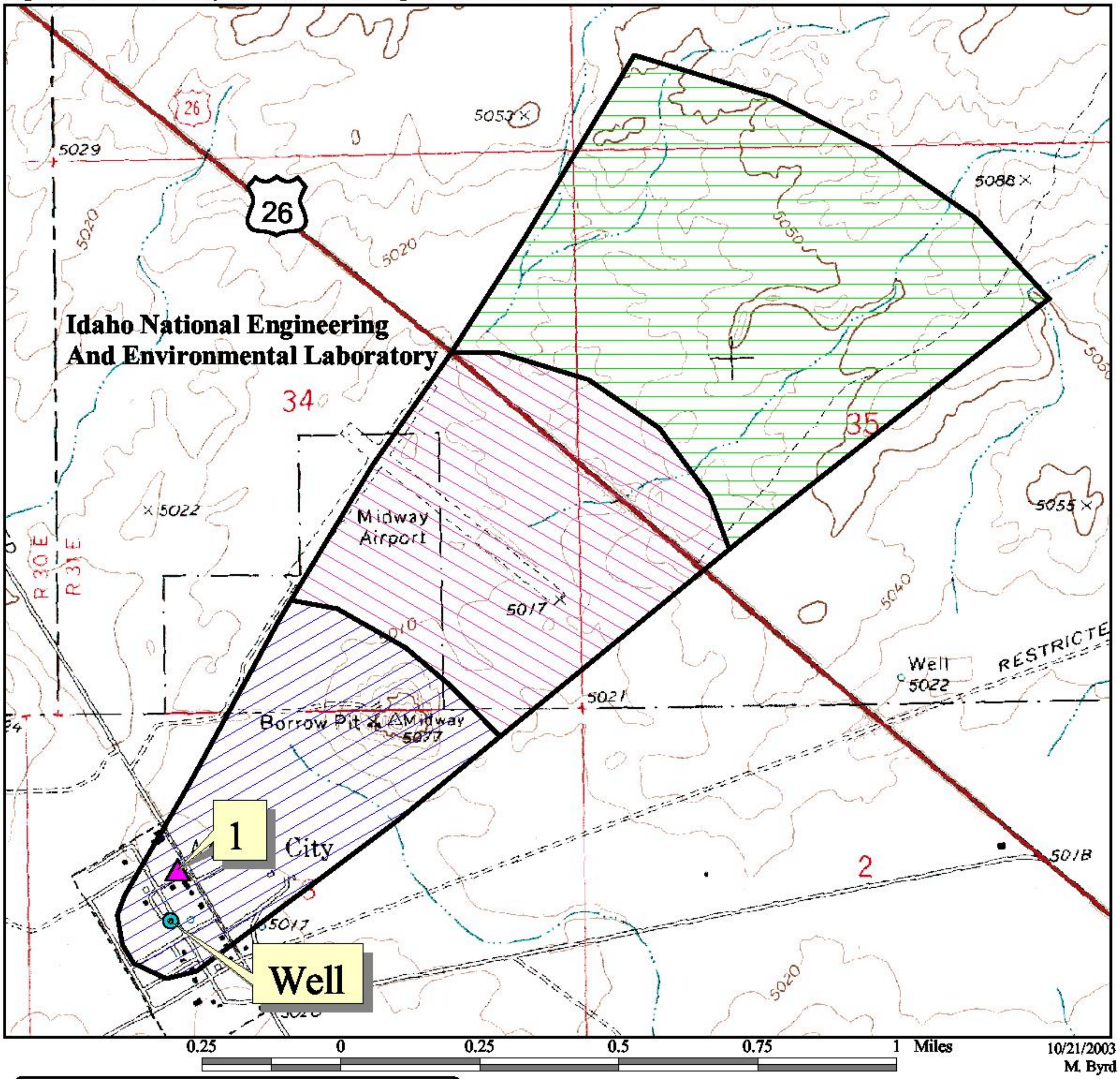
A potential source of contamination is defined as any facility or activity that stores, uses, or produces, as a product or by-product, the contaminants regulated under the Safe Drinking Water Act. Furthermore, these sources have a sufficient likelihood of releasing such contaminants into the environment at levels that could pose a concern relative to drinking water sources. The goal of the inventory process is to locate and describe those facilities, land uses, and environmental conditions that are potential sources of ground water contamination. Field surveys conducted by DEQ and reviews of available databases compiled in 1999 identified potential contaminant sources within the delineated areas.

It is important to understand that a release may never occur from a potential source of contamination provided they are using best management practices. Many potential sources of contamination are regulated at the federal level, state level, or both, to reduce the risk of release. Therefore, when a business, facility, or property is identified as a potential contaminant source, this should not be interpreted to mean that this business, facility, or property is in violation of any local, state, or federal environmental law or regulation. What it does mean is that the potential for contamination exists due to the nature of the business, industry, or operation. There are a number of methods that water systems can use to work cooperatively with potential sources of contamination, including educational visits and inspections of stored materials. Many owners of such facilities may not even be aware that they are located near a public water supply source.

Contaminant Source Inventory Process

A two-phased contaminant inventory of the study area was conducted in October and November of 2003. The first phase involved identifying and documenting potential contaminant sources within the Atomic City source water assessment area through the use of water system inventory information, the

Figure 2. The Atomic City Well Delineation Map and Potential Contaminant Source Locations



LEGEND

- Zone 1B (3-Year Time-Of-Travel)
- Zone 2 (6-Year Time-Of-Travel)
- Zone 3 (10-Year Time-Of-Travel)
- Wellhead
- Dairy
- LUST Site
- Enhanced Inventory
- CERCLA Site
- RCRA Site
- Recharge Point
- Injection Well
- SARA Title III Site (EPCRA)
- Closed UST Site
- Open UST Site
- Business Mailing List
- NPDES Site
- Mine
- AST
- Group1 Site
- Toxic Release Inventory
- Landfill
- Wastewater Land Application Site
- Cyanide Site

Scale = 1:16000

PWS No: 6060003

WELL

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sanitary survey, computer databases, and Geographic Information System (GIS) maps developed by DEQ. The second, or enhanced, phase of the contaminant inventory involved contacting the water system to identify and add any additional potential sources in the delineated areas. The enhanced inventory was completed with the assistance of Mr. Paul A. Smith, the certified drinking water operator for Atomic City. Telephone correspondence with Mr. Smith on October 27, 2003 and a site visit on November 20, 2003 noted that the small airstrip in the 6-year TOT zone was for emergency use only and no fuels or chemicals were stored on site. The old landfill located in the borrow pit northeast of the well has not been used for approximately 10 years. Also during the site visit, Mr. Smith recalled a residential abandoned well within the 3-year TOT zone. The exact location of the abandoned well is unknown. Additional potential contaminant sources were discussed and have been documented in Table 1 of this assessment. A map with the well location, delineated area, and potential contaminant sources are provided with this report (see Figure 2).

Table 1. Atomic City Well Potential Contaminant Inventory

MapID	Source Description	TOT Zone[1] (years)	Source of Information	Potential Contaminants[2]
	Abandoned Well	0-3	Enhanced Inventory	IOC, VOC, SOC, Microbials
	Septic Tanks (Approximately 10 to 15)	0-3	Enhanced Inventory	IOC, Microbials
1	Open UST	0-3	Database Inventory	VOC, SOC
	Old Landfill/Borrow Pit	0-3	Map/Enhanced Inventory	IOC, VOC, SOC, Microbials
	U.S. Route 26	3-6	GIS Map	IOC, VOC, SOC

[1] TOT = time-of-travel (in years) for a potential contaminant to reach the wellhead
[2] IOC = inorganic chemical, VOC = volatile organic chemical, SOC = synthetic organic chemical
[3] UST = underground storage tank

The potential contaminant sources within the delineation capture zones include an abandoned well; an open, but not actively used underground storage tank (UST) (labeled as MapID 1); U.S. Route 26; an old landfill/borrow pit; and approximately 10 to 15 septic tanks within the city. If the open UST is not properly maintained it may add VOC contaminants and SOC contaminants to the ground water. If an accidental spill or release occurred into the abandoned well or on the highway, IOC contaminants, VOC contaminants, SOC contaminants and microbial contaminants could be added to the aquifer system. The residents in Atomic City use individual septic tanks that may add IOC contaminants and microbial contaminants to the ground water. All potential contaminant sources identified within the delineated area may increase the overall vulnerability of the drinking water source.

Section 3. Susceptibility Analysis

The drinking water source's susceptibility to contamination was ranked as high, moderate, or low risk according to the following considerations: construction, land use characteristics, and potentially significant contaminant sources. The susceptibility rankings are specific to a particular potential contaminant or category of contaminants. Therefore, a high susceptibility rating relative to one potential contaminant does not mean that the water system is at the same risk for all other potential contaminants. The relative ranking that is derived for the drinking water source is a qualitative, screening-level step that, in many cases, uses generalized assumptions and best professional judgement. Attachment A contains the susceptibility analysis worksheet. The following summaries describe the rationale for the susceptibility ranking.

Hydrologic Sensitivity

The hydrologic sensitivity of a well is dependent upon four factors. These factors are surface soil composition, the material in the vadose zone (between the land surface and the water table), the depth to first ground water, and the presence of a 50-foot thick fine-grained zone above the water producing zone of the well. Slowly draining soils such as silt and clay typically are more protective of ground water than coarse-grained soils such as sand and gravel. Similarly, fine-grained sediments in the subsurface and a water depth of more than 300 feet from the surface protect the ground water from contamination.

Hydrologic sensitivity was rated high for the well. This is based upon Natural Resource Conservation Service regional soil classifications as moderate-to-well drained. Soils with poor to moderate drainage characteristics are thought to have better filtration capabilities than faster draining soils. The well is considered sensitive due to the lack of information available to determine the vadose zone composition and depth to first ground water. With all other factors equal, water taken from a greater ground water depth increases the opportunity for potential contaminant reduction through absorption and/or other dispersion mechanisms (Idaho Source Water Assessment Plan, October 1999, p. E-59). The formation rock type is thought to be basalt, but there is no information available to assess whether a 50-foot thick fine-grained zone, such as clay, is present to provide a barrier that will help reduce the downward movement of contaminants.

Well Construction

Well construction directly affects the ability of the well to protect the aquifer from contaminants. System construction scores are reduced when information shows that potential contaminants will have a more difficult time reaching the intake of the well. Lower scores imply a system that can better protect the water. If the casing and annular seal both extend into a low permeability unit then the possibility of cross contamination from other aquifer layers is reduced and the system construction score goes down. If the highest production interval is more than 100 feet below the water table, then the system is considered to have better buffering capabilities. When information was adequate, a determination was made as to whether the casing and annular seal extend into a low permeability unit and whether current PWS construction standards are met.

The system construction score was rated high for the well. According to the PWS sanitary survey water system inventory information for 2003, the wellhead and surface seal are maintained. During the November 20, 2003 site visit it was noted that the well does not have a approved screened vent. Venting the well casing may prevent a vacuum from forming when the well is turned on and cause the casing to slough. The vent should be down-turned and 18-inches above the ground surface. The vent should also have a 24-mesh non-corrodible screen to prevent insects and animals from entering the well casing. Mr. Smith indicated that the well vent can not be installed at this time due to a measuring tape caught inside the well casing. The water system is installing a new pump in Spring 2004 and the well vent will be corrected (Correspondence, 2003). No well driller's log was available to accurately assess the well's construction. The well is thought to have been drilled in 1950 to an unknown depth with a static water level of 585 feet bgs. The well has a 10-inch diameter casing. The casing thickness, depth and perforations are unknown. The recommended casing thickness is 0.365-inch for a well casing that is ten inches in diameter. Information about casing depth is important to assess whether it extends into a low permeability material, such as clay, because it could influence the well's susceptibility to laterally migrating contamination. The well's highest water producing zone is unknown. When water is drawn from deeper levels of the aquifer, it may provide a buffer from surface contaminants. The well is housed and located outside of a 100-year floodplain. This may decrease the chance of contaminants being drawn into the drinking water source in the event of surface water flooding, but protection from flooding is highly dependent on proper well house construction. According to the water system inventory information, the 50-foot sanitary setback for the well is owned by the water system.

The Idaho Department of Water Resources (IDWR) *Well Construction Standards Rules (1993)* require all PWSs to follow DEQ standards. IDAPA 58.01.08.550 requires that PWSs follow the *Recommended Standards for Water Works (1997)* during construction. Under current standards, all PWS wells are required to have a 50-foot buffer around the wellhead. These standards are used to rate the system construction for the well by evaluating items such as condition of wellhead and surface seal, whether the casing and annular space is within consolidated material or 18 feet below the surface, the thickness of the casing, etc. Pump tests for wells producing greater than 50 gallons per minute (gpm) require a minimum of a 6-hour test. If all criteria are not met, the public water source does not meet the IDWR Well Construction Standards. Because no well driller's information was available to determined whether the well meets current IDWR Well Construction Standards, the well has been rated conservatively.

Potential Contaminant Source and Land Use

The well rated moderately susceptible for IOCs (e.g., nitrates, arsenic), VOCs (e.g., petroleum products) and SOCs (e.g., pesticides), and low for microbial contaminants (e.g., bacteria). Even though the Bingham County fertilizer and herbicide usage is considered high, the land use in this area is predominantly rangeland.

Final Susceptibility Ranking

A detection above a drinking water standard MCL, any detection of a VOC or SOC, or a confirmed microbial detection at the drinking water source will automatically give a high susceptibility rating, despite the land use of the area, because a pathway for contamination already exists. Additionally, potential contaminant sources within 50 feet of a well will automatically lead to a high susceptibility rating. Having multiple potential contaminant sources in the 0- to 3-year TOT zone (Zone 1B) contributes greatly to the overall ranking.

Susceptibility Summary

In terms of total susceptibility, the well rated high for IOCs, VOCs, SOCs, and microbial contaminants (see Table 2). System construction rated high, hydrologic sensitivity rated high and the potential contaminant/land use scores were moderate for IOCs, VOCs, SOCs and low for microbial contaminants.

Table 2. Summary of Atomic City Susceptibility Evaluation

Drinking Water Source	Susceptibility Scores[1]									
	Hydrologic Sensitivity	Potential Contaminant Inventory[2]				System Construction	Final Susceptibility Ranking			
		IOC	VOC	SOC	Microbial		IOC	VOC	SOC	Microbial
Well	H	M	M	M	L	H	H	H	H	H

[1] **H = High Susceptibility, M = Moderate Susceptibility, L = Low Susceptibility**

[2] **IOC = inorganic chemical, VOC = volatile organic chemical, SOC = synthetic organic chemical**

Total coliform bacteria have been detected in the distribution system several times between July 1998 and March 2002 with two MCL violations that resulted in boil orders. Bacteria have not been detected in the distribution system since. It is unknown whether coliform bacteria have been detected at the wellhead.

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Section 4. Options for Drinking Water Protection

This assessment should be used as a basis for determining appropriate new protection measures or re-evaluating existing protection efforts. No matter what ranking a source receives, protection is always important. Whether the source is currently located in a "pristine" area or an area with numerous industrial and/or agricultural land uses that require surveillance, the way to ensure good water quality in the future is to act now to protect valuable water supply resources. If the system should need to expand in the future, new drinking water source sites should be located in areas with as few potential sources of contamination as possible, and the site should be reserved and protected for this specific use.

An effective drinking water protection program is tailored to the particular local drinking water protection area. A community with a fully developed drinking water protection program will incorporate many strategies. For Atomic City, drinking water protection activities should first focus on correcting any improvements outlined in the 2003 sanitary survey including adding a flow meter on the system and developing a backflow prevention plan. The water system is planning to install a screened vent on the wellhead while replacing the well's pump in Spring 2004. If total coliform becomes a concern, the water system should consider developing a flushing and disinfecting plan. The City's distribution system has several dead end lines that could result in stagnant water and increase the chances of bacteria growth. Contact the Southeastern District Health Department Drinking Water Coordinator to inquire about disinfecting options suitable for the size of the water system. It is important to evaluate possible sources of contamination, such as the ones included in this assessment, and document those sources to identify contaminant threats early that could impact the drinking water well. Other sources to evaluate near the well are residential areas with septic tanks and drainage fields to assist with preventing nitrate and bacteria contamination from those sources. The water system may want to investigate other on-site concerns including surface water drainage from parking areas to assure that the wellhead is protected from surface water contaminants. The city is currently evaluating system upgrades to the storage capacity and distribution lines. They are also evaluating customer rate increases and the use of meters to accurately assess water use.

Due to the time involved with the movement of ground water, drinking water protection activities should be aimed at long-term management strategies even though these strategies may not yield results in the near term. The water system is encouraged to develop a drinking water protection plan to document and rank potential contaminant sources, outline best management practices, and provide education for city staff and residents about the drinking water. A strong public education program should be a primary focus of any drinking water protection plan. Public education topics could include household hazardous waste disposal methods and the importance of water conservation. There are multiple resources available to help communities implement protection programs, including the Drinking Water Academy of the EPA. Working with the Idaho Department of Transportation, Bureau of Land Management, the Bingham County Soil and Conservation District, adjacent businesses and land owners will better inform the water system of chemicals that may be used or stored near the drinking water well.

A community must incorporate a variety of strategies in order to develop a comprehensive drinking water protection plan, be they regulatory in nature (e.g., zoning, permitting) or non-regulatory in nature (e.g., good housekeeping, public education, specific best management practices).

Assistance

Public water supplies and others may call the following DEQ offices with questions about this assessment and to request assistance with developing and implementing a local protection plan. In addition, draft protection plans may be submitted to the DEQ office for preliminary review and comments.

Michelle Byrd, Pocatello Regional DEQ Office   (208) 236-6160
State DEQ Office   (208) 373-0502
Website: http://www.deq.state.id.us
Water suppliers serving fewer than 10,000 persons may contact Melinda Harper (mlharper@idahoruralwater.com) with Idaho Rural Water Association at (208) 343-7001 for assistance with drinking water protection strategies.

POTENTIAL CONTAMINANT INVENTORY LIST OF ACRONYMS AND DEFINITIONS

AST (Aboveground Storage Tanks) – Sites with aboveground storage tanks.

Business Mailing List – This list contains potential contaminant sites identified through a yellow pages database search of standard industry codes (SIC).

CERCLA – This includes sites considered for listing under the **Comprehensive Environmental Response Compensation and Liability Act (CERCLA)**. CERCLA, more commonly known as Superfund is designed to clean up hazardous waste sites that are on the national priority list (NPL).

Cyanide Site – DEQ permitted and known historical sites/facilities using cyanide.

Dairy – Sites included in the primary contaminant source inventory represent those facilities regulated by Idaho State Department of Agriculture (ISDA) and may range from a few heads to several thousand head of milking cows.

Deep Injection Well – Injection wells regulated under the Idaho Department of Water Resources generally for the disposal of stormwater runoff or agricultural field drainage.

Enhanced Inventory – Enhanced inventory locations are potential contaminant source sites added by the water system. These can include new sites not captured during the primary contaminant inventory, or corrected locations for sites not properly located during the primary contaminant inventory. Enhanced inventory sites can also include miscellaneous sites added by the Idaho Department of Environmental Quality (DEQ) during the primary contaminant inventory.

Floodplain – This is a coverage of the 100-year floodplains.

Group 1 Sites – These are sites that show elevated levels of contaminants and are not within the priority one areas.

Inorganic Priority Area – Priority one areas where greater than 25% of the wells/springs show constituents higher than primary standards or other health standards.

Landfill – Areas of open and closed municipal and non-municipal landfills.

LUST (Leaking Underground Storage Tank) – Potential contaminant source sites associated with leaking underground storage tanks as regulated under RCRA.

Mines and Quarries – Mines and quarries permitted through the Idaho Department of Lands.)

Nitrate Priority Area – Area where greater than 25% of wells/springs show nitrate values above 5mg/l.

NPDES (National Pollutant Discharge Elimination System) – Sites with NPDES permits. The Clean Water Act requires that any discharge of a pollutant to waters of the United States from a point source must be authorized by an NPDES permit.

Organic Priority Areas – These are any areas where greater than 25% of wells/springs show levels greater than 1% of the primary standard or other health standards.

Recharge Point – This includes active, proposed, and possible recharge sites on the Snake River Plain.

RCRA – Site regulated under **Resource Conservation Recovery Act (RCRA)**. RCRA is commonly associated with the cradle to grave management approach for generation, storage, and disposal of hazardous wastes.

SARA Tier II (Superfund Amendments and Reauthorization Act Tier II Facilities) – These sites store certain types and amounts of hazardous materials and must be identified under the Community Right to Know Act.

Toxic Release Inventory (TRI) – The toxic release inventory list was developed as part of the Emergency Planning and Community Right to Know (Community Right to Know) Act passed in 1986. The Community Right to Know Act requires the reporting of any release of a chemical found on the TRI list.

UST (Underground Storage Tank) – Potential contaminant source sites associated with underground storage tanks regulated as regulated under RCRA.

Wastewater Land Applications Sites – These are areas where the land application of municipal or industrial wastewater is permitted by DEQ.

Wellheads – These are drinking water well locations regulated under the Safe Drinking Water Act. They are not treated as potential contaminant sources.

NOTE: Many of the potential contaminant sources were located using a geocoding program where mailing addresses are used to locate a facility. Field verification of potential contaminant sources is an important element of an enhanced inventory.

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Attachment A

Atomic City

Susceptibility Analysis Worksheet

Susceptibility Analysis Formulas

The final scores for the susceptibility analysis were determined using the following formulas:

1) VOC/SOC/IOC Final Score = Hydrologic Sensitivity + System Construction + (Potential Contaminant/Land Use x 0.2)

2) Microbial Final Score = Hydrologic Sensitivity + System Construction + (Potential Contaminant/Land Use x 0.375)

Final Susceptibility Scoring:

0 - 5 Low Susceptibility

6 - 12 Moderate Susceptibility

≥ 13 High Susceptibility

Ground Water Susceptibility Report — Public Water System Name : ATOMIC CITY — Well# : WELL
Public Water System Number 6060003 — 12/5/03 11:56:28 AM

1. System Construction		SCORE
Drill Date	1/1/50	
Driller Log Available	NO	
Sanitary Survey (if yes, indicate date of last survey)	YES	2003
Well meets IDWR construction standards	NO	1
Wellhead and surface seal maintained	NO	1
Casing and annular seal extend to low permeability unit	NO	2
Highest production 100 feet below static water level	NO	1
Well located outside the 100 year flood plain	YES	0
Total System Construction Score		5

2. Hydrologic Sensitivity		
Soils are poorly to moderately drained	NO	2
Vadose zone composed of gravel, fractured rock or unknown	YES	1
Depth to first water > 300 feet	NO	1
Aquitard present with > 50 feet cumulative thickness	NO	2
Total Hydrologic Score		6

3. Potential Contaminant / Land Use - ZONE 1A		IOC Score	VOC Score	SOC Score	Microbial Score
Land Use Zone 1A	RANGELAND, WOODLAND, BASALT	0	0	0	0
Farm chemical use high	YES	2	0	2	
IOC, VOC, SOC, or Microbial sources in Zone 1A	NO	NO	NO	NO	NO
Total Potential Contaminant Source/Land Use Score - Zone 1A		2	0	2	0
Potential Contaminant / Land Use - ZONE 1B					
Contaminant sources present (Number of Sources)	YES	3	3	3	3
(Score = # Sources X 2) 8 Points Maximum		6	6	6	6
Sources of Class II or III leacheable contaminants or	YES	3	3	2	
4 Points Maximum		3	3	2	
Zone 1B contains or intercepts a Group 1 Area	NO	0	0	0	0
Land use Zone 1B	Less Than 25% Agricultural Land	0	0	0	0
Total Potential Contaminant Source / Land Use Score - Zone 1B		9	9	8	6
Potential Contaminant / Land Use - ZONE II					
Contaminant Sources Present	YES	2	2	2	
Sources of Class II or III leacheable contaminants or	YES	1	1	1	
Land Use Zone II	Less than 25% Agricultural Land	0	0	0	
Potential Contaminant Source / Land Use Score - Zone II		3	3	3	0
Potential Contaminant / Land Use - ZONE III					
Contaminant Source Present	NO	0	0	0	
Sources of Class II or III leacheable contaminants or	NO	0	0	0	
Is there irrigated agricultural lands that occupy > 50% of	NO	0	0	0	
Total Potential Contaminant Source / Land Use Score - Zone III		0	0	0	0
Cumulative Potential Contaminant / Land Use Score		14	12	13	6
4. Final Susceptibility Source Score		14	13	14	13
5. Final Well Ranking		High	High	High	High